AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in this application:

Listing of Claims

1.   (Currently amended). A method of filtering an <u>EMG</u> input signal ~~containing wanted signal components and unwanted signal components~~ <u>contaminated by a disturbance signal, the filtering method</u> comprising:

modeling the ~~input signal as a set of~~ <u>disturbance signal as</u> polynomials <u>of lower orders</u>;

~~identifying polynomials from the set to model the unwanted signal components~~; and

removing the ~~unwanted signal components~~ <u>disturbance signal</u> ~~from the input signal~~ by removing the polynomials <u>of lower orders</u> ~~identified as modeling the unwanted signal components~~ from the ~~set of polynomials~~ <u>contaminated EMG input signal</u> to thereby ~~leave in the input signal only the wanted signal components~~ <u>obtain an EMG input signal substantially free from the disturbance signal</u>.

2-4.   (Cancelled).

5.   (Currently amended). A method ~~as defined in claim 1~~ <u>of filtering an input signal containing wanted signal components and unwanted signal components, comprising:</u>

<u>modeling the input signal as a set of polynomials;</u>

<u>modeling the unwanted signal components with a number of polynomials from the set;</u> and

<u>removing the unwanted signal components from the input signal by removing the number of polynomials modeling the unwanted signal components from the set of polynomials to thereby leave in the input signal only the wanted signal components;</u>

<u>-</u> wherein modeling the input signal as a set of polynomials comprises:

considering an epoch S(t) of the input signal in a limited time interval, said epoch S(t) having a time scale; and

normalizing the time scale of the epoch S(t).

6.   (Original). A method as defined in claim 5, wherein normalizing the time scale of the epoch S(t) comprises:

shifting and scaling the limited time interval under consideration into a new variable x in an interval -1<x<1 whereby the signal epoch becomes S(x).

7.   (Currently amended). A method as defined in claim ~~1~~ 5, wherein modeling the input signal as a set of polynomials ~~further~~ comprises modeling the input signal as a set of orthogonal polynomials.

8.   (Original). A method as defined in claim 6, wherein modeling the input signal as a set of polynomials comprises modeling the input signal as a set of orthogonal polynomials $Q_n(x)$.

9.   (Original). A method as defined in claim 8, wherein the set of orthogonal polynomials $Q_n(x)$ comprises:

a first initial polynomial $Q_0(x)$ having a constant value; and

a second initial polynomial $Q_1(x)$ having a constant slope.

10.   (Original). A method as defined in claim 7, comprising selecting the orthogonal polynomials from the group consisting of:

Legendre polynomials;

Tchebyshev T-polynomials; and

Tchebyshev U-polynomials.

11.   (Original). A method as defined in claim 8, wherein modeling the input signal as a set of polynomials comprise:

expressing the input signal as a sum of the polynomials $Q_n(x)$:

$$S(x)=\sum_{n=0}^{P} C_n \ Q_n(x)$$

where P represents a limited number of terms, and

$$C_n = \frac{1}{K_n} \int_{-1}^{+1} S(x)\ Q_n(x)\ f(x)\ dx$$

where f(x) is a function of x and K_n is a constant depending on the order n.

12. (Currently amended). A method as defined in claim 11, wherein ~~identifying polynomials from the set to model~~ modeling the unwanted signal components comprises:

associating particular orders of the polynomials with the unwanted signal components; and

modeling the unwanted signal components as a sum of the polynomials of said particular orders, comprising weighting the polynomials of said particular orders by means of the coefficients C_n.

13. (Currently amended). A method as defined in claim 12, wherein removing the number of polynomials ~~identified as~~ modeling the unwanted signal components from the set of polynomials comprises:

removing the sum of weighted polynomials from the sum of polynomials $Q_n(x)$.

14. (Currently amended). A method ~~as defined in claim 1~~ of filtering an input signal containing wanted signal components and unwanted signal components, comprising:

modeling the input signal as a set of polynomials;

modeling the unwanted signal components with a number of polynomials from the set;

and

removing the unwanted signal components from the input signal by removing the number of polynomials modeling the unwanted signal components from the set of polynomials to thereby leave in the input signal only the wanted signal components;

- wherein:

modeling the input signal as a set of polynomials comprises modeling the input signal as a sum of a limited number of polynomials; and

said method further comprises eliminating edge effects constituted by imperfections having a strength depending on the limited number of polynomials.

15.   (Currently amended). A method as defined in claim 14, wherein:

eliminating the edge effects comprises defining overlapping windows;

~~identifying polynomials from the set to model~~ modeling the unwanted signal components comprises ~~identifying~~ modeling, in each window, ~~polynomials from the set to model~~ the unwanted signal components with a number of polynomials from the set;

removing the ~~unwanted signal components~~ disturbance signal from the input signal comprises removing, in each window, the number of polynomials ~~identified as~~ modeling the unwanted signal components from the set of polynomials to thereby produce in said window a filtered signal part; and

eliminating edge effects further comprises:

in each window, weighting the filtered signal part to suppress the filtered signal part at opposite ends of the window and emphasize the filtered signal part in the central portion of said window; and

summing the weighted filtered signal parts of the overlapping windows to form an output filtered signal generally free from edge effects.

16.   (Original). A method as defined in claim 15, wherein defining overlapping windows comprises:

defining 50% overlapping windows.

17.   (Original). A method as defined in claim 15, wherein weighting the filtered signal part in each window comprises:

providing for each window an edge effect suppressing function; and

in each window, multiplying the filtered signal part by the edge effect suppressing function of said window.

18.   (Original). A method as defined in claim 17, wherein providing for each window an edge effect suppressing function comprises:

constructing an edge effect suppressing function in such a manner that:

a sum of the edge effect suppressing functions of the various overlapping windows is equal to unity; and

a value of the edge suppressing function at opposite ends of each window is equal to zero.

19.   (Original). A method as defined in claim 18, comprising selecting the edge effect suppressing functions of the overlapping windows from the group consisting of: a triangular function and a squared cosine function.

20.   (Currently amended). A method ~~as defined in claim 1~~ of filtering an input signal containing wanted signal components and unwanted signal components, comprising:

modeling the input signal as a set of polynomials;

modeling the unwanted signal components with a number of polynomials from the set;

and

removing the unwanted signal components from the input signal by removing the number of polynomials modeling the unwanted signal components from the set of polynomials to thereby leave in the input signal only the wanted signal components;

- wherein modeling the input signal as a set of polynomials comprises:

using higher order polynomials that mimic an oscillatory pattern of the input signal.

21.   (Currently amended). A device for filtering an EMG input signal ~~containing wanted signal components and unwanted signal components~~ contaminated by a disturbance signal, the device comprising:

means for modeling the ~~input signal as a set of~~ disturbance signal as polynomials of lower orders;

~~means for identifying polynomials from the set to model the unwanted signal components;~~ and

means for removing the ~~unwanted signal components~~ disturbance signal from the contaminated input signal, wherein the ~~unwanted signal components~~ disturbance signal removing means comprises means for removing the polynomials ~~identified as modeling the unwanted signal components~~ of lower orders from the ~~set of polynomials~~ input signal to thereby ~~leave in~~

~~the input signal only the wanted signal components~~ obtain an EMG input signal substantially free from the disturbance signal.

22.   (Currently amended). A device ~~as defined in claim 21~~ for filtering an input signal containing wanted signal components and unwanted signal components, comprising:

        means for modeling the input signal as a set of polynomials;

        means for modeling the unwanted signal components with a number of polynomials of said set; and

        means for removing the unwanted signal components from the contaminated input signal, wherein the unwanted signal components removing means comprises means for removing the number of polynomials modeling the unwanted signal components from the set of polynomials to thereby leave in the input signal only the wanted signal components;

        - wherein the input signal modeling means comprises:

        means for considering an epoch $S(t)$ of the input signal in a limited time interval, said epoch $S(t)$ having a time scale; and

        means for normalizing the time scale of the epoch $S(t)$, wherein said time scale normalizing means comprises means for shifting and scaling the limited time interval under consideration into a new variable x in an interval $-1<x<1$ whereby the signal epoch becomes $S(x)$.

23.   (Original). A device as defined in claim 22, wherein the input signal modeling means comprises:

        means for modeling the input signal as a set of orthogonal polynomials $Q_n(x)$.

24.   (Original). A device as defined in claim 23, wherein the set of orthogonal polynomials $Q_n(x)$ comprises:

        a first initial polynomial $Q_0(x)$ having a constant value; and

        a second initial polynomial $Q_1(x)$ having a constant slope.

25.   (Original). A device as defined in claim 24, wherein the input signal modeling means comprises:

means for expressing the input signal as a sum of the polynomials $Q_n(x)$:

$$S(x)=\sum_{n=0}^{P} C_n \ Q_n(x)$$

where P represents a limited number of terms, and

$$C_n \ = \ \frac{1}{K_n} \int_{-1}^{+1} S(x) \ Q_n(x) \ f(x) \ dx$$

where f(x) is a function of x and K_n is a constant depending on the order n.

26.   (Original). A device as defined in claim 25, wherein:

the input signal modeling means comprises means for modeling the input signal as a sum of a limited number of polynomials; and

said device further comprises means for eliminating edge effects constituted by imperfections having a strength depending on the limited number of polynomials.

27.   (Currently amended). A device as defined in claim 26, wherein:

the edge effects eliminating means comprises means for defining overlapping windows;

the ~~polynomials identifying means~~ means for modeling the unwanted signal components comprises means for ~~identifying~~ modeling, in each window, ~~polynomials from the set to model~~ the unwanted signal components with a number of polynomials of said set;

the unwanted signal components removing means comprises means for removing, in each window, the number of polynomials ~~identified as~~ modeling the unwanted signal components from the set of polynomials to thereby produce in said window a filtered signal part; and

the edge effects eliminating means further comprises:

for each window, means for weighting the filtered signal part to suppress the filtered signal part at opposite ends of the window and emphasize the filtered signal part in the central portion of said window; and

means for summing the weighted filtered signal parts of the overlapping windows to form

an output filtered signal generally free from edge effects.

28.   (Original). A device as defined in claim 27, wherein the overlapping windows comprise

50% overlapping windows.

29.   (Original). A device as defined in claim 27, wherein the filtered signal part weighting

means comprises:

        means for providing for each window an edge effect suppressing function; and

        means for multiplying, in each window, the filtered signal part by the edge effect

suppressing function of said window.

30.   (Currently amended). A method of filtering an ~~EMG~~ input signal ~~containing wanted~~

~~signal components and unwanted signal components~~ contaminated by a disturbance signal, the

filtering method comprising:

        modeling the EMG input signal as ~~a set of~~ polynomials of higher orders;

        ~~identifying polynomials from the set to model the wanted signal components;~~ and

        outputting the polynomials ~~identified as modeling the wanted signal components~~ of

higher orders as an estimate of the EMG input signal substantially free from the ~~unwanted signal~~

~~components~~ disturbance signal.

31.   (Currently amended). A method as defined in claim 30, wherein the ~~wanted signal~~

~~components comprise a myoelectric signal and the unwanted signal components comprise~~

disturbance signal comprises at least one of a cardiac signal, motion disturbance, and background

noise.

32.-33. (Cancelled).

34.   (Currently amended). A method ~~as defined in claim 30~~ of filtering an input signal

containing wanted signal components and unwanted signal components, comprising:

modeling the input signal as a set of polynomials;

modeling the wanted signal components with a number of the polynomials of said set;
and

outputting the polynomials modeling the wanted signal components as an estimate of the
input signal substantially free from the unwanted signal components;

- wherein modeling the input signal comprises:

considering an epoch S(t) of the signal in a limited time interval, said epoch S(t) having a
time scale; and

normalizing the time scale of the epoch S(t).

35. (Original). A method as defined in claim 34, wherein normalizing the time scale of the
epoch S(t) comprises:

shifting and scaling the limited time interval under consideration into a new variable x in
an interval $-1 < x < 1$ whereby the signal epoch becomes S(x).

36. (Currently amended). A method as defined in claim 30, wherein modeling the EMG
input signal as a-set-of polynomials of higher orders comprises modeling said EMG input signal
as a-set-of orthogonal polynomials of higher orders.

37. (Original). A method as defined in claim 35, wherein modeling the input signal as a set
of polynomials comprises modeling the input signal as a set of orthogonal polynomials $Q_n(x)$.

38. (Original). A method as defined in claim 37, wherein the set of orthogonal polynomials
$Q_n(x)$ comprises:

a first initial polynomial $Q_0(x)$ having a constant value; and

a second initial polynomial $Q_1(x)$ having a constant slope.

39. (Original). A method as defined in claim 36, comprising selecting the orthogonal
polynomials from the group consisting of:

Legendre polynomials;

Tchebyshev T-polynomials; and

Tchebyshev U-polynomials.

40.   (Original). A method as defined in claim 37, wherein modeling the input signal as a set of polynomials comprises:

expressing the input signal as a sum of the polynomials $Q_n(x)$:

$$S(x) = \sum_{n=0}^{P} C_n \ Q_n(x)$$

where P represents a limited number of terms, and

$$C_n \ = \ \frac{1}{K_n} \int_{-1}^{+1} S(x) \ Q_n(x) \ f(x) \ dx$$

where f(x) is a function of x and K_n is a constant depending on the order n.

41.   (Cancelled).

42.   (Currently amended). A method as defined in claim 30, further comprising weighting the polynomials ~~identified as~~ modeling the ~~wanted signal components~~ the EMG input signal by means of weighting coefficients.

43.   (Currently amended). A method as defined in claim 40, wherein ~~identifying polynomials from the set to model the wanted signal components~~ modeling the wanted signal components with a number of the polynomials of said set comprises:

associating particular orders of the polynomials with the wanted signal components; and

modeling the wanted signal components as a sum of the polynomials of said particular orders, comprising weighting the polynomials of said particular orders by means of the coefficients C_n.

44.   (Currently amended). A method ~~as defined in claim 30~~ of filtering an input signal containing wanted signal components and unwanted signal components, comprising:

modeling the input signal as a set of polynomials;

modeling the wanted signal components with a number of the polynomials of said set; and

outputting the polynomials modeling the wanted signal components as an estimate of the input signal substantially free from the unwanted signal components;

- wherein modeling the input signal as a set of polynomials comprises:

using higher order polynomials that mimic an oscillatory pattern of the input signal.

45.   (Currently amended). A method ~~as defined in claim 30~~ of filtering an input signal containing wanted signal components and unwanted signal components, comprising:

modeling the input signal as a set of polynomials;

modeling the wanted signal components with a number of the polynomials of said set; and

outputting the number of polynomials modeling the wanted signal components as an estimate of the input signal substantially free from the unwanted signal components;

- wherein:

modeling the input signal as   a set of polynomials comprises modeling the input signal as a sum of a limited number of polynomials; and

said method further comprises eliminating edge effects constituted by imperfections having a strength depending on the limited number of polynomials.

46.   (Currently amended). A method as defined in claim 45, wherein:

eliminating the edge effects comprises defining overlapping windows;

~~identifying polynomials from the set to model~~ modeling the wanted signal components comprises ~~identifying~~ modeling, in each window, ~~polynomials from the set to model~~ the wanted signal components with a number of polynomials of said set;

outputting the number of polynomials ~~identified as~~ modeling the wanted signal components comprises outputting, for each window, the number of polynomials ~~identified as~~ modeling the wanted signal components to thereby produce in said window a filtered signal part; and

eliminating the edge effects further comprises:

in each window, weighting the filtered signal part to suppress the filtered signal part at opposite ends of the window and emphasize the filtered signal part in the central part of said window; and

summing the weighted filtered signal parts of the overlapping windows to form an output filtered signal generally free from edge effects.

47.   (Original). A method as defined in claim 46, wherein defining overlapping windows comprises:

defining 50% overlapping windows.

48.   (Original). A method as defined in claim 46, wherein weighting the filtered signal part in each window comprises:

providing for each window an edge effect suppressing function; and

in each window, multiplying the filtered signal part by the edge effect suppressing function of said window.

49.   (Original). A method as defined in claim 48, wherein providing for each window an edge effect suppressing function comprises:

constructing an edge effect suppressing function in such a manner that:

a sum of the edge effect suppressing functions of the various overlapping windows is equal to unity; and

a value of the edge suppressing function at opposite ends of each window is equal to zero.

50.   (Original). A method as defined in claim 48, comprising selecting the edge effect suppressing functions of the overlapping windows from the group consisting of: a triangular function and a squared cosine function.

51.   (Currently amended). A device for filtering an <u>EMG</u> input signal ~~containing wanted signal components and unwanted signal components~~ contaminated by a disturbance signal, the <u>device</u> comprising:

means for modeling the <u>EMG</u> input signal as ~~a set of~~ polynomials <u>of higher orders;</u>

~~means for identifying polynomials from the set to model the wanted signal components;~~ and

means for outputting the polynomials ~~identified as modeling the wanted signal components~~ <u>of higher orders</u> as an estimate of the EMG input signal substantially free from the ~~unwanted signal components~~ <u>disturbance signal.</u>

52.   (Currently Amended). A device ~~as defined in claim 30~~ <u>for filtering an input signal containing wanted signal components and unwanted signal components, comprising:</u>

<u>means for modeling the input signal as a set of polynomials;</u>

<u>means for modeling the wanted signal components with a number of the polynomials of said set; and</u>

<u>means for outputting the polynomials modeling the wanted signal components as an estimate of the input signal substantially free from the unwanted signal components;</u>

<u>-</u> wherein the input signal modeling means comprises:

means for considering an epoch S(t) of the signal in a limited time interval, said epoch S(t) having a time scale; and

means for normalizing the time scale of the epoch S(t), wherein said time scale normalizing means comprises means for shifting and scaling the limited time interval under consideration into a new variable x in an interval $-1 < x < 1$ whereby the signal epoch becomes S(x).

53.   (Original). A device as defined in claim 52, wherein the input signal modeling means comprises:

means for modeling said input signal as a set of orthogonal polynomials $Q_n(x)$.

54.   (Original). A device as defined in claim 53, wherein the set of orthogonal polynomials $Q_n(x)$ comprises:

a first initial polynomial $Q_0(x)$ having a constant value; and

a second initial polynomial $Q_1(x)$ having a constant slope.

55.   (Currently amended). A device as defined in claim 54, wherein the input signal modeling means comprises:

means for expressing the input signal as a sum of the polynomials $Q_n(x)$:

$$S(x) = \sum_{n=0}^{P} C_n \ Q_n(x)$$

where P represents a limited number of terms, and

$$C_n \ = \ \frac{1}{K_n} \int_{-1}^{+1} S(x) \ Q_n(x) \ f(x) \ dx$$

where f(x) is a function of x and K_n is a constant depending on the order n.

56.   (Original). A device as defined in claim 55, wherein:

the input signal modeling means comprises means for modeling the input signal as a sum of a limited number of polynomials; and

said device further comprises means for eliminating edge effects constituted by imperfections having a strength depending on the limited number of polynomials.

57.   (Currently amended). A device as defined in claim 56, wherein:

the edge effects eliminating means comprises means for defining overlapping windows;

the ~~polynomials identifying~~ means for modeling the wanted signal components comprises means for ~~identifying~~ modeling, in each window, ~~polynomials from the set to model~~ the wanted signal components with a number of the polynomials of said set;

the polynomials outputting means comprises means for outputting, for each window, the polynomials ~~identified as~~ modeling the wanted signal components to thereby produce in said window a filtered signal part; and

the edge effects eliminating means further comprises:

for each window, means for weighting the filtered signal part to suppress the filtered signal part at opposite ends of the window and emphasize the filtered signal part in a central portion of said window; and

means for summing the weighted filtered signal parts of the overlapping windows to form an output filtered signal generally free from edge effects.

58.   (Original). A device as defined in claim 57, wherein the overlapping windows comprise 50% overlapping windows.

59.   (Original). A device as defined in claim 57, wherein the filtered signal part weighting means comprises:

        means for providing for each window an edge effect suppressing function; and

        means for multiplying, in each window, the filtered signal part by the edge effect suppressing function of said window.

60.   (Currently amended). A method of filtering an input signal containing wanted signal components and unwanted signal components, comprising:

        modeling the input signal as a set of polynomials;

        determining, for each polynomial, a weighting coefficient indicative of signal strength; and

        summing the weighting coefficients to provide an estimate of the strength of the wanted signal components;

        - wherein summing the weighting coefficients comprises:

        summing the weighting coefficients on a square law basis with polynomial order weighting to give an estimate of a power of the wanted signal components.

61.   (Original). A method as defined in claim 60, wherein determining, for each polynomial, a weighting coefficient indicative of signal strength comprises:

        modeling the strength of the wanted signal components through the weighting coefficients.

62.   (Cancelled).

63.   (Currently amended). A method as defined in claim 60 of filtering an input signal
containing wanted signal components and unwanted signal components, comprising:

    modeling the input signal as a set of polynomials;

    determining, for each polynomial, a weighting coefficient indicative of signal strength;
and

    summing the weighting coefficients to provide an estimate of the strength of the wanted
signal components;

    - wherein summing the weighting coefficients comprises:

    calculating a sum of the weighting coefficients on a square law basis with a weighting
proportional to the number of oscillations for the order of the polynomial, normalized
with respect to the sum of the weighting coefficients on a square law basis with
polynomial order weighting, in order to obtain a dominating periodicity of the wanted
signal components.

64.   (Currently amended). A method as defined in claim 60 of filtering an input signal
containing wanted signal components and unwanted signal components, comprising:

    modeling the input signal as a set of polynomials;

    determining, for each polynomial, a weighting coefficient indicative of signal strength;
and

    summing the weighting coefficients to provide an estimate of the strength of the wanted
signal components;

    - wherein modeling the input signal as a set of polynomials comprises:

    considering an epoch $S(t)$ of the input signal in a limited time interval, said epoch $S(t)$
having a time scale; and

    normalizing the time scale of the epoch $S(t)$.

65.   (Original). A method as defined in claim 64, wherein normalizing the time scale of the
epoch $S(t)$ comprises:

    shifting and scaling the limited time interval under consideration into a new variable x in
an interval $-1 < x < 1$ whereby the signal epoch becomes $S(x)$.

66.   (Original). A method as defined in claim 65, wherein modeling the input signal as a set of polynomials comprises modeling the signal as a set of orthogonal polynomials $Q_n(x)$.

67.   (Original). A method as defined in claim 66, comprising selecting the orthogonal polynomials from the group consisting of:

Legendre polynomials;

Tchebyshev T-polynomials; and

Tchebyshev U-polynomials.

68.   (Original). A method as defined in claim 66, wherein modeling the input signal as a set of polynomials comprises:

expressing the input signal as a sum of the polynomials $Q_n(x)$:

$$S(x) = \sum_{n=0}^{P} C_n \; Q_n(x)$$

where P represents a limited number of terms, and

$$C_n \;=\; \frac{1}{K_n} \int_{-1}^{+1} S(x) \; Q_n(x) \; f(x) \; dx$$

where f(x) is a function of x and K_n is a constant depending on the order n,

wherein the terms C_n constitute said weighting factors.

69.   (Currently amended). A device for filtering an input signal containing wanted signal components and unwanted signal components, comprising:

means for modeling the input signal as a set of polynomials;

means for determining, for each polynomial, a weighting factor indicative of signal strength; and

means for summing the weighting coefficients to provide an estimate of the strength of the wanted signal components;

- wherein the weighting coefficients summing means comprises:

means for summing the weighting coefficients on a square law basis with polynomial order weighting to give an estimate of a power of the EMG input signal substantially free from the disturbance signal.

70.   (Original). A device as defined in claim 69, wherein the determining means comprises:

means for modeling the strength of the wanted signal components through the weighting coefficients.

71.   (Cancelled).

72.   (Currently amended). A device as defined in claim 69 for filtering an input signal containing wanted signal components and unwanted signal components, comprising:

means for modeling the input signal as a set of polynomials;

means for determining, for each polynomial, a weighting factor indicative of signal strength; and

means for summing the weighting coefficients to provide an estimate of the strength of the wanted signal components;

- wherein the means for summing the weighting coefficients comprises:

means for calculating a sum of the weighting coefficients on a square law basis with a weighting proportional to the number of oscillations for the order of the polynomial, normalized with respect to the sum of the weighting coefficients on a square law basis with polynomial order weighting, in order to obtain a dominating periodicity of the wanted signal components input signal.

73.   (Currently amended). A device as defined in claim 69 for filtering an input signal containing wanted signal components and unwanted signal components, comprising:

means for modeling the input signal as a set of polynomials;

means for determining, for each polynomial, a weighting factor indicative of signal strength; and

    <u>means for summing the weighting coefficients to provide an estimate of the strength of</u> <u>the wanted signal components;</u>

    - wherein the input signal modeling means comprises:

    means for considering an epoch S(t) of the input signal in a limited time interval, said epoch S(t) having a time scale; and

    means for normalizing the time scale of the epoch S(t).

74.   (Original). A device as defined in claim 73, wherein the time scale normalizing means comprises:

    means for shifting and scaling the limited time interval under consideration into a new variable x in an interval -1<x<1 whereby the signal epoch becomes S(x).

75.   (Original). A device as defined in claim 74, wherein the input signal modeling means comprises means for modeling the signal as a set of orthogonal polynomials $Q_n(x)$.

76.   (Original). A device as defined in claim 75, wherein the input signal modeling means comprises:

    means for expressing the input signal as a sum of the polynomials $Q_n(x)$:

$$S(x)=\sum_{n=0}^{P} C_n \ Q_n(x)$$

where P represents a limited number of terms, and

$$C_n \ = \ \frac{1}{K_n} \int_{-1}^{+1} S(x) \ Q_n(x) \ f(x) \ dx$$

where f(x) is a function of x and K_n is a constant depending on the order n,

    wherein the terms C_n constitute said weighting factors.

77.   (New). A method of filtering as defined in claim 1, wherein the disturbance signal comprises at least one signal selected from the group consisting of: ECG signals, movement induced disturbances, and background noise.

78.   (New). A method of filtering as defined in claim 1, wherein polynomials of lower orders comprise Legendre polynomials of orders from zero (0) to seven (7).

79.   (New). A method of filtering as defined in claim 1, wherein the polynomials of lower orders comprise at least one of Tchebychev T-polynomials and Tchebychev U-polynomials.

80.   (New) A method of filtering as defined in claim 1, further comprising modeling the contaminated EMG input signal as a set of polynomials and wherein removing the disturbance signal comprises removing the polynomials of lower orders from the set of polynomials modeling the contaminated EMG input signal to thereby obtain an EMG input signal substantially free from the disturbance signal.

81.   (New). A device as defined in claim 21, wherein the disturbance signal comprises at least one signal selected from the group consisting of: ECG signals, movement induced disturbances and background noise.

82.   (New). A device as defined in claim 21, wherein the polynomials of lower orders comprise Legendre polynomials of orders from zero (0) to seven (7).

83.   (New). A device as defined in claim 21, wherein the polynomials of lower orders comprise at least one of Tchebychev T-polynomials and Tchebychev U-polynomials.

84.   (New) A device as defined in claim 21, further comprising means for modeling the contaminated EMG input signal as a set of polynomials and wherein the means for removing the disturbance signal comprises means for removing the polynomials of lower orders from the set of polynomials modeling the contaminated EMG input signal to thereby obtain an EMG input signal substantially free from the disturbance signal.

85.   (New). A method of filtering as defined in claim 30, wherein the disturbance signal comprises at least one signal selected from the group consisting of: ECG signals, movement induced disturbances and background noise.